on board. From 7 of these cases influenza virus similar to A2/Hong Kong/68 was isolated.

Only 8 cases of typical influenza were reported in the hospitals in the city of Madras on 9 September 1968. The number increased rapidly day by day, reaching 7661 on 17 September. Subsequently it declined to 68 on 31 October. During the period 9 September to 31 October, 84 511 patients were treated in the hospitals in Madras City, which has a population of 2 million. The attack rate was therefore 4.2%. It is estimated that an equal number of persons were treated by the private practitioners in the city, thus giving an attack rate of 8.4%.

Subsequently, the epidemic spread to different areas in Madras State. Cases were reported in Chingleput, Conjeevaram, Pondicherry, Vellore, Coimbatore, and the Nilgiris during the latter part of September. The epidemic spread to Madurai, Tirupur, Karur, Trichy, Tanjore, and Palni during the first half of October. Tirunelveli, Ramnad and Salem were affected during the middle and latter part of October. Influenza activity declined during the second half of November and December in Madras State.

The isolation of 2 strains of Hong Kong virus, one at Coonoor on 29 August and the other at Ootacamund, about 350 miles (560 km) from Madras on 31 August indicated that the virus had been seeded even before the arrival of the *S.S. Rajula* from Singapore on 8 September 1968.

The main epidemic spread through the Indian subcontinent within 20 weeks. In each area the pattern was one of sweeping spread through the most crowded cities followed by a relatively slow spread across villages and towns.

All age-groups were involved, although the manifestation of the disease appeared to be more severe among children.

Persons who had an attack of Asian influenza in 1957 and those who had an attack of proved A2 influenza subsequently generally escaped infection by the Hong Kong virus.

All patients complained of headache, generalized aches and pains, malaise, and fever. Some complained of backache, sore throat, and cough. Very few patients had respiratory complications such as pneumonia and bronchopneumonia. Sputum cultures from such cases showed nonhaemolytic streptococci and staphylococci. Electrocardiographic studies showed evidence of myocardial inflammation. Gastrointestinal symptoms such as vomiting, jaundice, and hiccup were rare compared with the epidemic of 1957. A few patients with clinical signs of encephalitis or myelitis and meningism associated with mild disorientation were also encountered. On the whole the disease was relatively mild with few complications.

From Madras City and other towns in the State, 146 strains of influenza virus were isolated from 29 August to 31 December 1968. All of them were similar to A2/Hong Kong/68 virus. Throughout this period, when over 442 throat gargles were processed, not one strain of type B virus was isolated, indicating the absence of influenza virus B infection.

The 1968 Influenza Outbreak in Thailand

by CHANINTHORN SUVONGSE[a]

About 1 month after the outbreak of influenza in Hong Kong on 13 July 1968,[b] febrile illness was reported among US troops at the US Air Force Base, Korat Province, in the north-eastern part of Thailand. Within 3 weeks the number of cases reached epidemic level. The US component of the SEATO Medical Research Laboratory and the Faculty of Public Health, Mahidol University, made a detailed study among US troops in that area. Following the outbreak, the disease seemed to spread rapidly to Bangkok and various other provinces. The epidemic began in August, reached its peak in October, and declined during the last part of November. In general, clinical symptoms were mild and the incidence of complications was relatively low. No deaths definitely attributable to influenza were reported.

In Bangkok health authorities were alerted to-

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[b] Thong-Charoen, P. et al. (1969) *J. med. Ass. Thailand*, 52, No. 9.

TABLE 1
AGE AND SEX DISTRIBUTIONS OF PATIENTS WITH CLINICAL SYMPTOMS OF INFLUENZA-LIKE ILLNESS, BANGKOK, AUGUST 1968

Age (years)	Siriraj Hospital			Vachira Hospital			Private practitioners		
	No. of males	No. of females	Percentage	No. of males	No. of females	Percentage	No. of males	No. of females	Percentage
<5	51	41		24	20		127	92	
6–10	37	27	46	23	24	42	187	146	59
11–15	48	30		38	30		262	258	
16–20	77	41		92	65		163	256	
21–30	72	73		120	89		117	187	
31–40	59	55		62	39		131	188	
41–50	28	32	54	31	33	58	127	117	41
51–60	23	32		16	23		75	59	
⩾61	12	20		19	11		18	38	
Total	407	351	100	425	334	100	1 207	1 341	100

wards the end of August, when 6 medical students developed an influenza-like illness [b] and increasing numbers of patients with similar symptoms were seen in out-patient departments of various hospitals.

Epidemiological data were obtained from 2 large hospitals in Bangkok (Siriraj and Vachira hospitals). Questionnaires were also sent to various private practitioners asking about influenza-like signs and symptoms in their patients. The age and sex distributions of patients are shown in Table 1. The data indicate that all age-groups were affected and that the male-to-female ratio was almost 1 : 1.

The viral agents isolated appeared to be homogeneous and were shown by the HI test to be similar to the influenza A2/Hong Kong/68 strain (see Tables 2 and 3).

For serological investigation, 104 pairs of sera were collected 1 week apart. A 4-fold or greater

TABLE 2
HI TITRES OF VIRUSES ISOLATED AT SIRIRAJ HOSPITAL, BANGKOK, DURING THE 1968 INFLUENZA EPIDEMIC

Virus isolated	Titre to the following hyperimmune rooster antisera		
	A2/Bangkok/18/68	A2/Hong Kong/1/68	A2/Aichi/2/68
A2/Bangkok/18/68	640	1 280	320
A2/Bangkok/21/68	320	1 280	320
A2/Bangkok/24/68	640	2 560	640
A2/Bangkok/37/68	640	640	640
A2/Aichi/2/68	640	1 280	640
A2/Singapore/1/57	>20	—	>20

TABLE 3
HI TITRES OF VIRUSES ISOLATED AT THE NATIONAL INFLUENZA CENTRE, BANGKOK, 1968

Virus isolated	Titre to the following hyperimmune ferret antisera			
	A2/Singapore/1/57	A2/England/12/64	A2/Tokyo/3/67	A2/Hong Kong/1/68
A2/Singapore/1/57	>2 560	240	80	160
A2/England/12/64	480	>2 560	64	80
A2/Tokyo/3/67	<20	30	160	<20
A2/Hong Kong/1/68	80	<20	<20	1 920
A2/Bangkok/2/68	60	<20	<20	1 920

rise in HI antibody titre was demonstrated in 52 cases.

Based on inquiries made to 6630 families (1.7% of the total population) in Bangkok, the attack rate was estimated to be 47 per thousand and the total number of patients in this city was approximately 150 000. However, since the influenza during this outbreak was mild and since analysis was based on clinical diagnosis only, the extent of the outbreak may have been underestimated.

Epidemiological Data on Hong Kong Influenza in France

by R. SOHIER [a] & M. HENRY [b]

Hong Kong influenza was first observed in France in the last 2 weeks of January 1969, when sporadic cases occurred in the district of Paris, and developed progressively throughout the country. The peak was reached in March, the incidence began to decrease in April, and the last cases were observed in May.

The incidence remained relatively low and the extent moderate, and the disease was mild or of moderate severity. In many parts of the country, only sporadic cases were observed. Some local outbreaks were reported in towns or villages. Generally, influenza (confirmed by virus isolation or by serological tests) was observed in all age-groups, but in some outbreaks the greatest incidence occurred in children aged 4 years or less; in other outbreaks it occurred among those aged 15–24 years. The disease occurred less frequently among the older age-groups.

It was difficult to obtain comprehensive mortality data, since notification of influenza is not compulsory in France, but deaths from clinically diagnosed cases were reported by some practitioners. Data on such reported cases are collected every year in roughly the same manner, and the figures for the first 4 months of 1967, 1968, and 1969 can be compared. During these past years, all but one of the influenza A2 outbreaks occurred in a period extending from January to April, with a peak in February–March, as we have been able to show by means of a continuous survey performed by CF tests using soluble (nucleocapsidic) type-specific antigen.

As shown in the accompanying figure, the number of deaths from influenza during the first 4 months of 1969 was 3186, less than the number for the comparable periods of 1968 and 1967 (7267 and 3472, respectively).

The first positive CF test appeared in the course of our continuous surveillance some weeks before the

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